Bath & North East Somerset Council

North Keynsham

Sustainable Transport Strategy for Safeguarded Land at Keynsham

August 2021

Project Code: 04669

Final Issue

PJA
Brew House
Jacob Street
Tower Hill
Bristol
BS2 0EQ
pja.co.uk

Version Control and Approval

Version	Date	Main Contributor	Issued by	Approved by
1.0	20 May 2021	AS, KC, BSJM	MMM	JT
2.0	08 June 2021	AS, KC, BSJM	MMM	JT
3.0	26 August 2021	MMcF, JM	EK	JT

Prepared for

Claire Cornelius

Bath & North East Somerset Council

Contents

Section		Page
1	Introduction	1
1.1	Overview	1
1.2	Local Plan position	1
1.3	The Low Carbon Transport Strategy (LCTS)	2
1.4	Methodology	7
2	Development Traffic Generation and Distribution	9
3	Traffic Impact	13
3.1	Paramics Modelling	13
3.2	Modelling Assumptions	13
3.3	Results summary	13
3.4	Network Operation	14
3.5	Queue Lengths	14
3.6	Highway Mitigation	16
4	Alternative Mitigation Strategies	17
4.1	Low Carbon Transport	17
4.2	Sustainable Travel Strategy	18
5	Summary and Conclusion	20
5.2	Conclusion	21

1 Introduction

1.1 Overview

1.1.1 This note sets out the methodology and results of a high-level assessment which has been undertaken to consider whether some development at North Keynsham could be included within the current Local Plan Partial Update, and if it is, the scale of such development and the infrastructure which is likely to be required to support this development and make it acceptable on highway grounds.

1.1.2

1.2 Local Plan position

1.2.1 When land at East Keynsham was being considered for development in the Core Strategy, B&NES Council concluded that whilst Keynsham is a relatively sustainable location, the scope for development was constrained by the impact on the A4 and the town as a whole, that more significant development would require major transport infrastructure. It was concluded that there were exceptional circumstances to remove land from the Green Belt for a moderate level of development before substantial infrastructure requirements are triggered. The outcome was that two parcels of land at East Keynsham was allocated for around 250 homes plus employment as set out in Policy KE3a (blue hatched area below), the southern part now being developed as Hygge Park.

1.2.2 In addition, Policy KE3b of the Core Strategy removed two areas of land adjacent to the Policy KE3a southern allocation (Hygge Park) from the Green Belt and safeguarded them for possible development in the future (green hatched areas). Whilst being suitable for development in principle, these two areas of land were not allocated for development primarily because of the transport impacts that may trigger substantial infrastructure requirements. In line with national policy, Policy KE3b states that planning permission for development of the safeguarded land will only be granted once it is proposed for development following a review of the Local Plan, as is now being undertaken through the partial update of the Local Plan.

1.2.3 The outline permission for Hygge Park (16/00850/OUT) included a high-level masterplan which showed how the site could in the future link to the safeguarded land.

1.2.4 A planning application (18/01509/OUT) for the eastern parcel of safeguarded land was refused permission, in part due to highway impact. A current application for the eastern parcel of safeguarded land (20/02673/OUT) is pending consideration.

1.2.5 Further assessment of the suitability and deliverability of land at north and east Keynsham has continued since the adoption of the Core Strategy, via the SHLAA (Strategic Housing Land Assessment). This further work resulted in the preparation of a Strategic Planning Framework which informed the Joint Spatial Plan (now withdrawn) and the new Local Plan consultations in 2017 and 2018. At this stage, the safeguarded land was considered as part of the wider North Keynsham Strategic Development Location (SDL) to deliver a comprehensive mixed -use development including around 1,500 homes.

1.2.6 At the start of the Local Plan Partial Update process the evidence available to the Council (including the Keynsham Core Strategy Options Highways Impact Assessment, CH2M, Feb 2014; and Transport Evidence Explanatory Note for the Placemaking Plan, CH2M, April 2016) supported the view that any development above and beyond that proposed in the current Development Plan would be likely to have severe implications on the highway network, which need to be adequately addressed and mitigated. National Policy states that development should be refused on highway grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe. Consequently, based on this conclusion little or no additional housing can currently be expected to be delivered until substantial infrastructure improvements are made to the existing transport infrastructure in the town.

1.2.7 This note seeks to provide B&NES Council with additional evidence to identify if and what local transport improvements are required to mitigate the impacts of any development beyond that proposed in the current Development Plan.

1.2.8 The assessment adopted a methodology which:

Considered infrastructure and complimentary measures to enable greater use of zero and low carbon transport modes

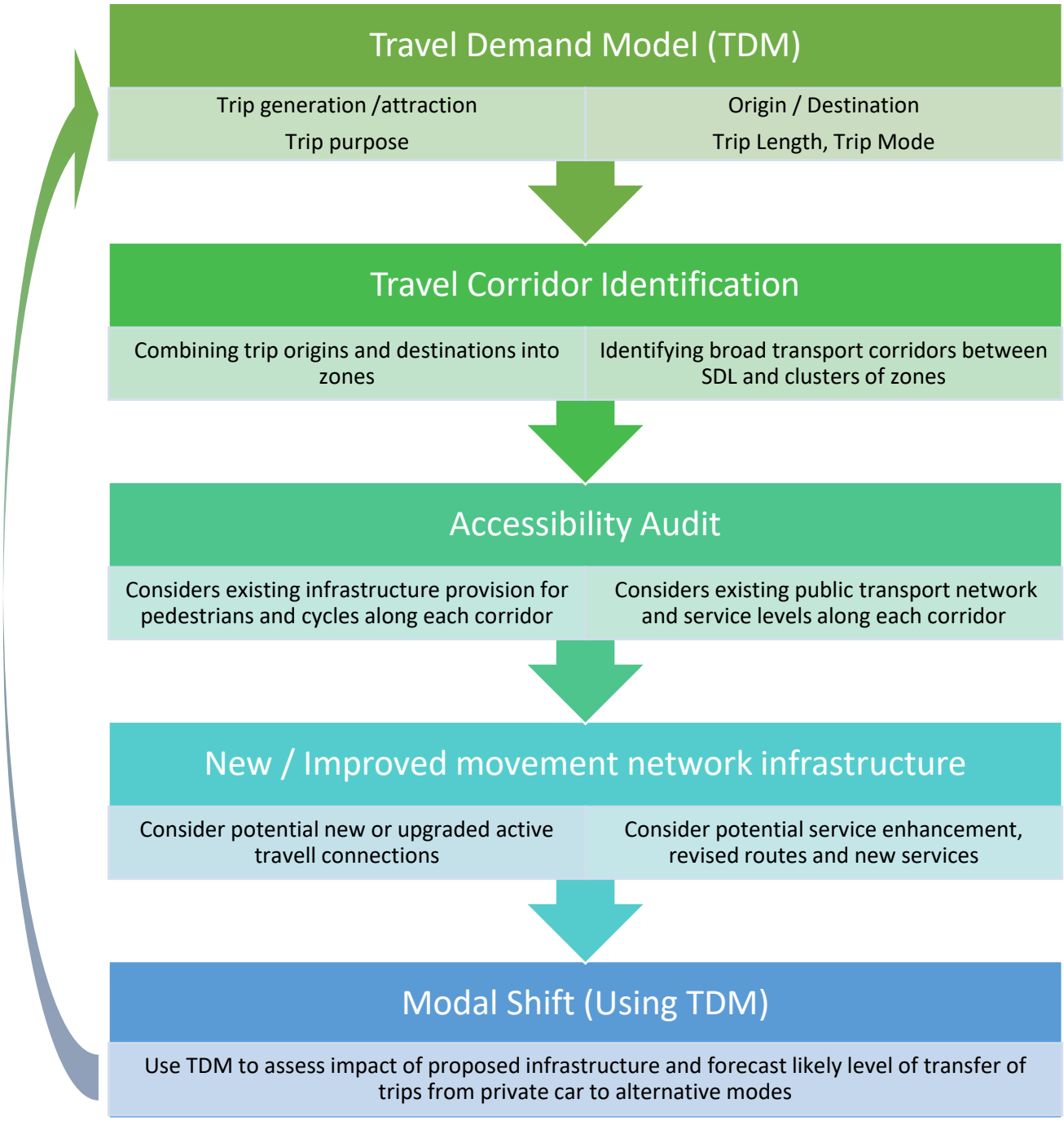
Considered the impact of these measures upon modal choice of new development trips and upon existing Keynsham travel patterns

Forecasts modal shift within existing Keynsham travel patterns away from car use

Considers infrastructure measures on a corridor-by-corridor basis aligned with forecast travel pattern, including origin/destination and journey purpose.

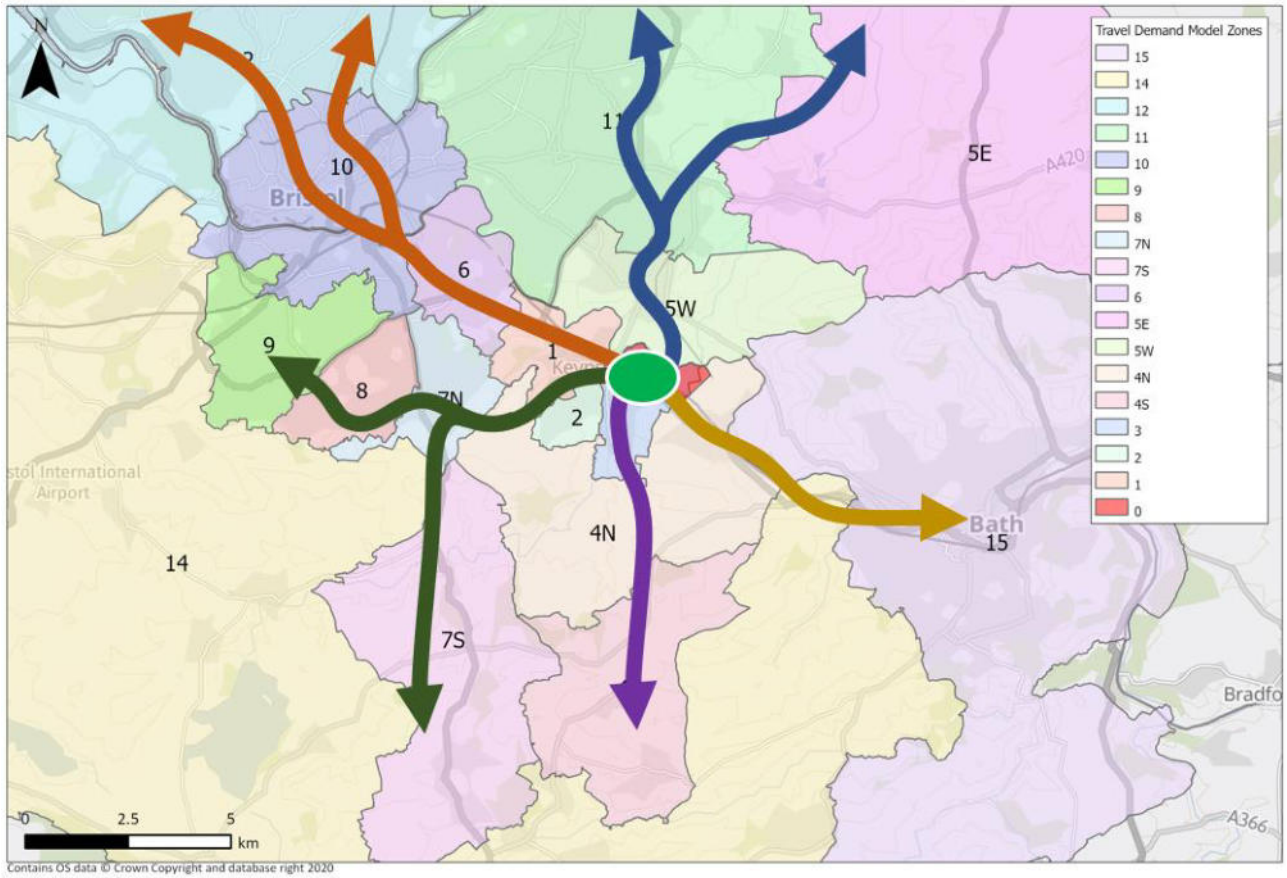
1.2.9 Unlike the transport mitigation strategies for most developments that focus on trips generated by a particular site, the assessment has looked at the **Keynsham area as a whole** to identify corridors and routes where upgrades to public transport, walking and cycling infrastructure would unlock mode-shift from private motorised car trips. This is a process known as "trip-banking".

1.2.10 The steps followed to consider potential levels of mode shift and trip banking were as follows.



1.2.11 The TDM utilises information taken from the 2011 Census, the 2018 national travel survey, the DCLG Employment Density Guide, the 2018/2019 School Census, and TRICS Database to calculate the potential trip generation of each development land use, and the baseline mode split of the trips and the distribution of these trips. The TDM calculates the trip generation for the morning and afternoon peak periods, and for a typical weekday.

1.2.12 The trip origins and destinations are clustered into zones, and the zones are then clustered into common travel corridors. For North Keynsham 18 zones were coded into the TDM and journeys to and from these were clustered into five travel corridors, plus a central zone covering travel to and from central Keynsham.



1.2.13 On each of the key travel corridors the existing walking, cycling and public transport provision was identified and rated in order to calculate an accessibility score which is then related back to the baseline mode shares. The scope of the assessment for walking infrastructure lies within an area extending 2km of the centre of Keynsham and the centre of the SDL. For cycling the assessment area would typically extend to an area of 5km representing a 20-minute cycle, however with the increasing levels of eBike use this has been extended to 8km which encompasses south-east Bristol and western areas of Bath.

1.2.14 Once the baseline position was established a detailed corridor analysis was undertaken to consider where new active travel links could be introduced, or where existing provision could be enhanced. The analysis was informed through desktop assessment and fieldwork.

1.2.15 While the target of the overall development at North Keynsham is Net Zero, the guiding principle of the assessment was to recommend infrastructure and investment to corridors that would deliver significant modal shift, potentially resulting in a net reduction in carbon emissions even with the development traffic included.

1.2.16 The broad principle of the corridor analysis aligns to the GG 142 Walking, cycling and horse-riding assessment and review (WCHAR) process set out in DMRB, and the process for identifying corridors aligns to the Local Cycling and Walking Infrastructure Plan (LCWIP) process guidance issued by the Department for Transport (DfT).

1.2.17 The proposed cycle infrastructure measures align with the guidance set out within LTN 1/20 Cycle Infrastructure Design and are planned to meet the core design principles that cycle infrastructure is Coherent, Direct, Safe, Comfortable and Attractive.

1.2.18 The study has also considered a number of previous and emerging studies and has sought to align to these **and inform them where necessary**. These include the recent WECA LCWIP and West of England Bus Strategy, the ongoing Bath-Bristol Mass Transit study, the Hicks Gate Park and Ride study and the B&NES Liveable Neighbourhoods and Resident Parking Schemes strategies. This includes suggestions how these can be applied locally and specifically to the site.

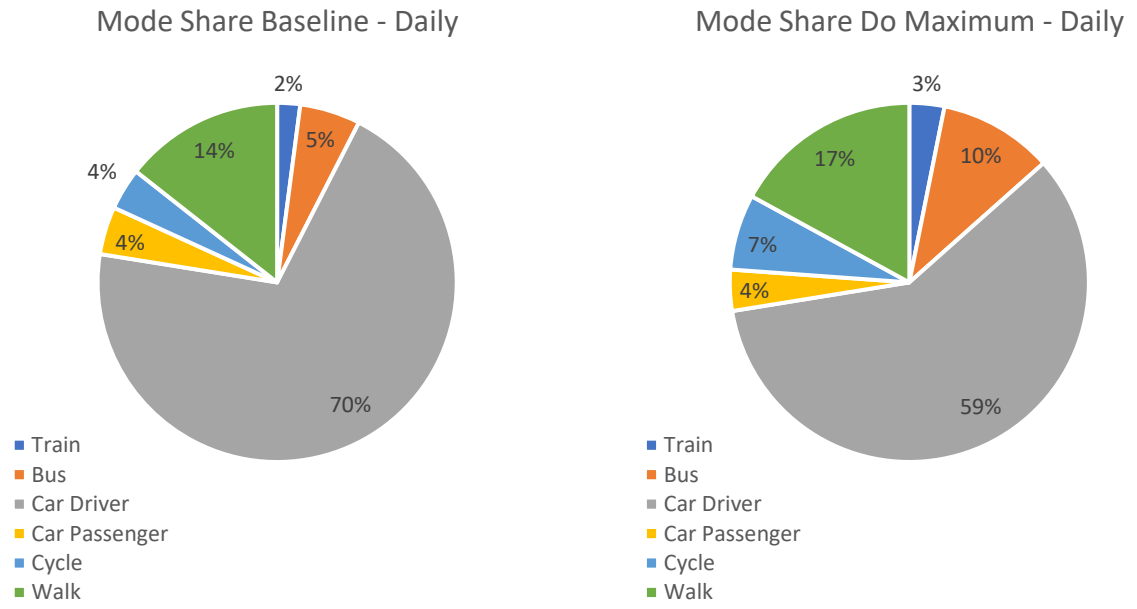
1.2.19 Updated accessibility scores were then calculated for the new and/or improved active travel and public transport networks serving the SDL and Keynsham in general and these have been used to forecast the potential transfer of trips from private car to other modes.

1.2.20 Within the SDL, the TDM was used to forecast the shift between potential private car trips and walking, cycling and public transport trips compared to the baseline situation. Within the existing areas of Keynsham the TDM utilises the vehicle trip matrix from the existing local S-Paramics traffic model and forecasts how car journeys between the various origins and destinations within the town could transfer to alternative modes. However, as the baseline of existing walking, cycling and public transport trips within Keynsham is unknown, the impact of the infrastructure and complimentary measures is described as a percentage reduction in car trips rather than a percentage increase in low carbon trips.

1.2.21 The TDM forecasts that the delivery of all the measures would result in the SDL generating 16% less vehicle trips (-1,560 trips) per day. Across Keynsham it is forecast that the measures would deliver an 11% reduction in car trips per day (-10,350 trips).

1.2.22 As the measures focus on reducing car use for the trips which can be undertaken by foot, by bike or by public transport, the reduction in private vehicle kilometres is not the same proportion as the reduction in overall trips as it is generally the shorter trips which have the greatest potential for change. The impact of the measures is likely to reduce vehicle kilometres by 8% (-8,144km per day), or around 2.1 million kilometres per year. More widely across Keynsham the proposals could reduce vehicle kilometres by around 14 million kilometres per annum.

1.2.23 The change in mode share across a typical day can be seen in the charts below.



1.2.24 On a daily basis it is forecast that there will be a reduction in car use of around 11 percentage points (-16%), with increases in the levels of walking, cycling and bus use forecast. Levels of cycle and bus use are forecast too at least double. Car passenger trips are forecast to remain stable, as is rail based public transport use.

1.3 Methodology

1.3.1 This high-level assessment utilises the TDM, in order to provide an indication of when and where additional infrastructure might be required in order to mitigate the transport impacts of various scales of development.

1.3.2 This note considers four development scenarios for the safeguarded land and land within the North Keynsham SDL, these being:

- Scenario A – 300 dwellings (safeguarded land only)
- Scenario B – 600 dwellings + 25% of Employment

- Scenario C – 900 dwellings + 50% of Employment + 1 FE school
- Scenario D – 1200 dwellings + 75% of Employment + 2FE school

1.3.3 Each scenario is incrementally larger than the previous and all scenarios contain less development than has been proposed as part of the North Keynsham SDL (1,500 homes + 32,000 sqm Employment + 3 FE school).

1.3.4 For the purposes of this assessment it has been assumed that development in each of these four scenarios would be accessed via a single junction on the A4 broadly in the location of the proposed Multi-modal corridor intersection. For the latter scenarios it is unlikely that this level of development could be accommodated on the land to the south of the railway, and therefore an additional access point would be required either via an improvement to Broadmead Lane or via a multi-modal corridor connecting to the A4175.

1.3.5 The TDM calculates the vehicle trip generation and zonal distribution for each development scenario which allows active and public transport infrastructure to be targeted towards the locations and corridors where the largest impact is forecast.

1.3.6 The flows produced by the TDM have also been run through the validated Paramics model to identify capacity constraints on the local road network, and to consider the network operation more generally.

1.3.7 Once this baseline situation is understood, the impact of various infrastructure measures are considered in order to understand which elements are required to substantially offset or mitigate the development traffic impacts.

1.3.8 The measures considered include:

- A4 Bath – Bristol Mass Transit (including parallel provision for active travel)
- MetroWest service improvements at Keynsham
- LCWIP Active travel proposals within Keynsham
- Active Travel Proposals
- Enhanced Public Transport services

1.3.9 This study does not attempt to predict the impact of the Covid-19 pandemic on longer term travel patterns. It is likely that peak hour travel patterns, particularly journeys to and from work will be changed in the longer term with reductions in the number of people travelling to work, and the frequency of journeys to work.

2 Development Traffic Generation and Distribution

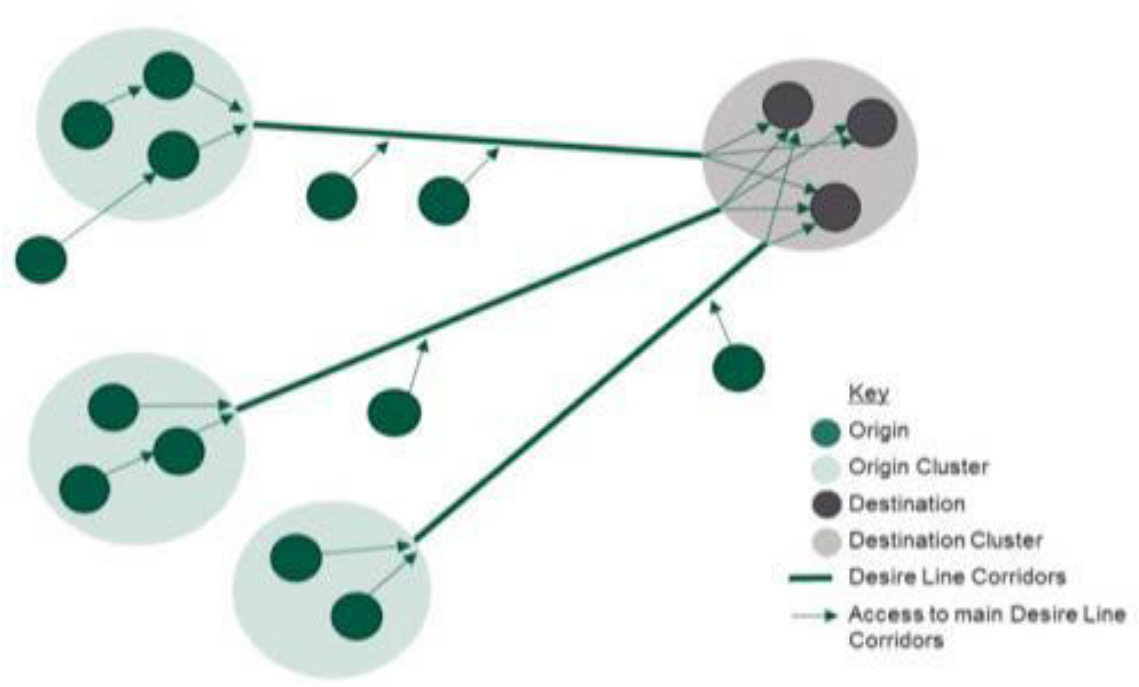
2.1.1 The baseline traffic generation of each scenario is set out below.

	AM (08:00 – 09:00)			PM (17:00 – 18:00)		
Scenario	**Arrival**	**Departure**	**Two-way**	**Arrival**	**Departure**	**Two-way**
Scenario A	44	155	199	132	53	185
Scenario B	138	319	458	274	167	441
Scenario C	200	415	615	401	269	670
Scenario D	282	557	840	538	378	917

2.1.2 These trips have been distributed across the TDM zone network, and destinations which share common travel corridors have been clustered to aid with the identification of appropriate infrastructure to drive mode share change within the development traffic and background traffic more generally.

2.1.3 The corridors for assessment have been assembled by a high-level inspection of nearby trip attractors, within the optimal travel distance for each mode. This follows the LCWIP "clustering" process indicated below.

Figure 2-1: LCWIP method of Origin-Destination clustering



2.1.4 In the context of this study, each corridor has three functions:

(1) Distributing outbound trips generated by the residential element of the allocated development, with mode shares assigned to each destination cluster based on trip distance, journey purpose, and infrastructure (existing and proposed)

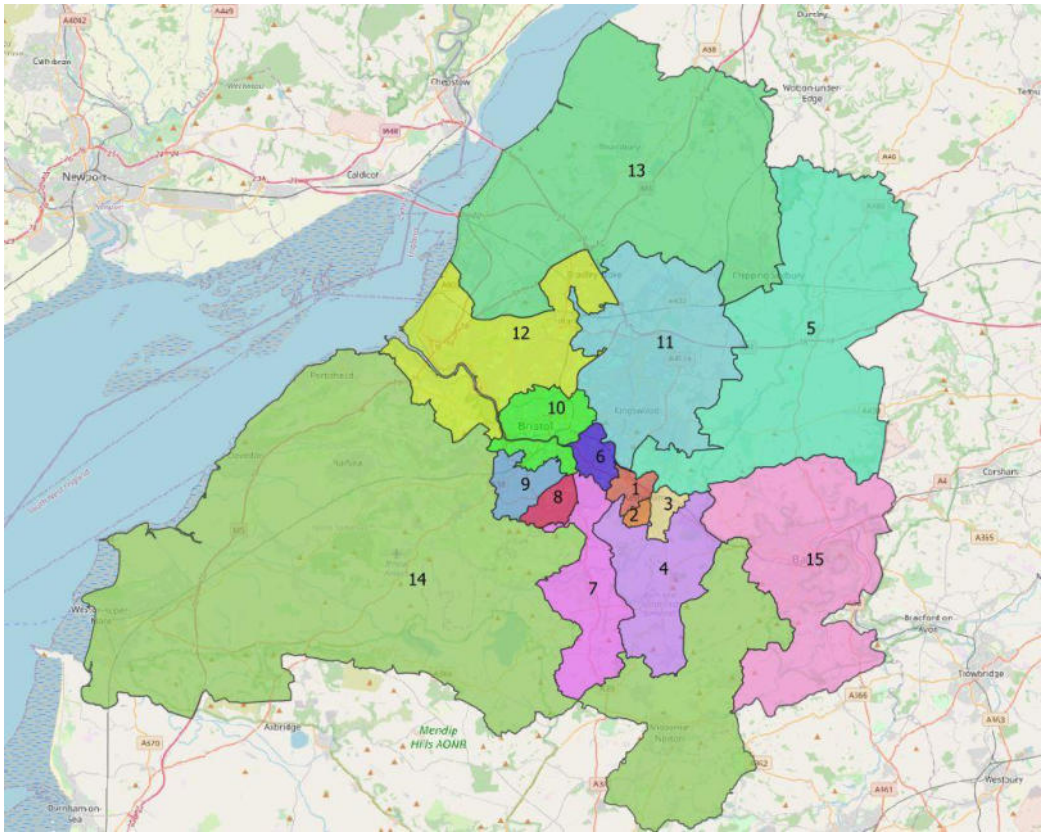
(2) Distributing inbound trips generated by the non-residential element of the allocated development, with mode shares assigned to each destination cluster based on trip distance, journey purpose, and infrastructure (existing and proposed)

(3) Accommodating existing travel demand, such that the scope for mode shift stimulated by new infrastructure can be quantified, i.e. to forecast the volume of "trip banking"

2.1.5 Five travel corridors have been identified, plus a central zone as set out in the table below and these have been utilised for the purpose of this assessment.

Table 2-1 and Figure 2.1: Corridors, clusters and modelling zones

Corridor	Destination clusters	Gravity model zone
West (A4 west)	Brislington Bristol Central Bristol South West Bristol West, Avonmouth, North Somerset	6, 9, 10, 12, 14
Central	Keynsham town centre Somerdale Keynsham East Keynsham South East Keynsham South West	1, 2, 3
East (A4 east)	Saltford Bath Wiltshire West & South	4N, 15
North (A4174 / A4175 north)	Willsbridge & Bitton Kelston Longwell Green, Oldland Common, Warmley Bristol North & East *(Kingswood, Lyde Green, Frenchay, Filton, Southmead, etc.)* Wiltshire North & East Rest of Gloucestershire	5W, 5E, 11, 13
South East (B3116 Wellsway)	North East Somerset east of Chew Valley Rest of Somerset	4S
South West (Charlton Road)	Queen Charlton, Whitchurch, Bristol South	7N, 7S, 8



2.1.6 The distribution of development traffic along each corridor in the AM and PM peaks can be seen for each scenario below.

AM Peak	Scenario A		Scenario B		Scenario C		Scenario D	
	Arrival	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*
Central	33%	34%	30%	31%	29%	30%	29%	29%
West	25%	23%	26%	23%	30%	27%	30%	27%
East	22%	22%	21%	20%	14%	14%	14%	14%
North	17%	19%	19%	21%	22%	24%	22%	24%
South East	1%	1%	1%	1%	1%	1%	1%	1%
South West	2%	2%	3%	3%	4%	4%	4%	4%

PM Peak	Scenario A		Scenario B		Scenario C		Scenario D	
	Arrival	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*
Central	21%	23%	21%	22%	20%	21%	20%	21%
West	35%	29%	33%	28%	34%	29%	34%	29%
East	19%	19%	18%	18%	16%	16%	16%	16%
North	22%	25%	23%	26%	24%	28%	24%	28%
South East	1%	1%	1%	1%	1%	1%	1%	1%
South West	3%	4%	4%	5%	4%	5%	4%	5%

2.1.7 The distribution of development traffic along each corridor in the AM and PM peaks can be seen for each scenario below.

AM Peak	Scenario A		Scenario B		Scenario C		Scenario D	
	Arrival	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*
Central	14	52	42	99	58	123	81	163
West	11	35	35	74	60	113	84	152
East	10	34	29	64	29	58	41	78
North	7	29	27	68	43	98	62	134
South East	0	1	2	3	3	5	4	8
South West	1	4	4	11	7	17	10	24

PM Peak	Scenario A		Scenario B		Scenario C		Scenario D	
	Arrival	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*	*Arrival*	*Departure*
Central	28	12	57	36	81	57	108	80
West	45	15	91	47	138	78	184	109
East	25	10	49	30	64	43	85	61
North	28	13	64	44	97	74	131	105
South East	1	0	3	2	5	4	7	5
South West	4	2	10	8	16	13	22	19

2.1.8 In each case the predominant travel corridors are those to the West – towards Bristol, central – to and from destinations within Keynsham, the North – toward South Gloucestershire and Bristol's East and North fringes, and to the East – towards Bath.

3 Traffic Impact

3.1 Paramics Modelling

3.1.1 In order to understand the unmitigated impact of development traffic the flows for each scenario (A-D as set out in Paragraph 1.4.2) have been assessed utilising the updated and validated Paramics model of Keynsham.

3.2 Modelling Assumptions

3.2.1 The Paramics model has been validated to a 2019 base as part of a wider study considering strategic development locations in North Keynsham. The model includes an allowance for committed development in Keynsham, primarily at Somerdale, South West Keynsham and Hygge Park.

3.2.2 Beyond this, the model makes no allowance for background traffic growth. Given the congested nature of the local road network (primarily to the east and west of the Paramics model extents) and uncertainty around changes to travel patterns resulting from the Covid-19 Pandemic and the Climate Emergency Response this is considered to be a reasonable and robust approach.

3.2.3 The model only considers a morning peak period (07:00 – 10:00) and an afternoon peak period (15:00 – 19:00) as these are the validated periods.

3.2.4 The model runs assume no highway network improvements or changes, other than the introduction of a new junction on the A4 to the east of Pixash Lane. This is the junction at which the development traffic has been added to the network for all scenarios. This is a simplification, particularly for the larger development quantum where multiple junctions are likely to be required to serve development to the north and south of the A4 as discussed previously.

3.2.5 Following initial feedback from B&NES Council's Highway Consultant and further consideration from the modelling team, a dummy signal at the western extent of the model was removed for the model runs. The fixed-time signal was included within the validated model to help represent the exit blocking from the model. However, there are concerns that this does not have sufficient elasticity to accurately reflect the impact of additional demand, and it has been removed to prevent the routing being unduly affected.

3.3 Results summary

3.3.1 The model results are provided for a reference (base) case and for each of the development scenarios. In general the reference case indicates that certain parts of the network are close to or at saturation, with other parts of the network having spare capacity; the Keynsham Road / Avon Mill Lane junction in particular shows queues during the peak hours in the reference case. The

network is therefore sensitive to where new traffic is loading on, what parts of the network it wishes to access, and when it impacts.

3.3.2 The Paramics model showed only moderate additional impacts apparent on the network with the scenario A development traffic added, with a slightly greater level of impact under Scenario B development traffic increases. The Scenarios C and D development traffic had a fairly significant additional impacts upon the network operation resulting in a near halving of vehicle speeds across the model.

3.3.3 In all model scenarios the impact of additional development traffic was generally greater during the afternoon period than it was during the morning period.

3.3.4 The primary impacts of additional traffic on the model network were seen at:

- Bath Hill Eastbound (the route out of the Town Centre);
- A4 / Broadmead Lane roundabout both Eastbound (from the Bypass) and Northbound (from the Town Centre along Bath Hill);
- Hicks Gate Roundabout entry from Bristol (in the PM);
- A4 junction with the development traffic (where the proposed roundabout for the NKSDL is on the A4) on both eastern and northern arms;
- The junction of Avon Mill Lane with Keynsham Road.

3.4 Network Operation

3.4.1 The results in the table below show the impact of additional development traffic upon the network operation through changes in average vehicle speed. It can be seen that the impact of the Scenario A development traffic is negligible, but with each development increase the impact becomes more significant, with the scenario D development traffic impact resulting in 30% – 44% reduction in average vehicle speeds in the morning and afternoon peaks respectively.

AM Peak	AM Peak		PM Peak	
	Average Speed	*Change from Ref Case*	*Average Speed*	*Change from Ref Case*
Reference Case	22.0		21.8	
Scenario A	21.6	-0.5	21.5	-0.3
Scenario B	20.5	-1.6	20.3	-1.4
Scenario C	18.3	-3.8	18.1	-3.6
Scenario D	15.4	-6.6	12.2	-9.6

3.5 Queue Lengths

3.5.1 The results in the tables overleaf show the impact of additional development traffic upon mean maximum queue lengths (vehicles) at key junctions across the network.

AM Peak 08:00 – 09:00 Junction	Reference Case	Scenario A	Scenario B	Scenario C	Scenario D
A4175 / Somerdale junction	7	7	7	8	11
Keynsham Road/Avon Mill Road	48	52	53	56	54
Bristol Road / Station Road Roundabout	5	5	5	6	6
Bath Hill / Avon Mill Lane staggered crossroads	10	13	16	18	21
Bath Road / Wellsway junction	15	16	19	21	25
High St/Bath Hill/Temple St	5	5	5	6	8
Charlton Road/Ashton Way	13	12	12	12	12
High St/Charlton Road	2	2	2	3	2
Hicks Gate Roundabout	11	12	13	13	13
Broadmead Roundabout	10	11	21	33	42
Pixash Ln/Bypass	2	2	3	3	3
Avon Mill Ln/MMC	2	3	3	4	4
MMC/A4 (East end of MMC)	5	8	15	22	30
PM Peak 17:00 – 18:00 Junction	Reference Case	Scenario A	Scenario B	Scenario C	Scenario D
A4175 / Somerdale junction	8	8	8	8	14
Keynsham Road/Avon Mill Road	47	48	55	55	76
Bristol Road / Station Road Roundabout	16	16	15	17	21
Bath Hill / Avon Mill Lane staggered crossroads	12	12	13	18	27
Bath Road / Wellsway junction	8	10	11	18	31
High St/Bath Hill/Temple St	5	5	6	6	9
Charlton Road/Ashton Way	13	13	14	15	16
High St/Charlton Road	3	2	3	3	5
Hicks Gate Roundabout	14	14	16	24	39
Broadmead Roundabout	10	12	21	36	62
Pixash Ln/Bypass	4	4	6	11	11
Avon Mill Ln/MMC	5	5	5	4	6
MMC/A4 (East end of MMC)	4	5	10	17	50

3.5.2 The queue length results again support the suggestion that the local road network could potentially accommodate the level of development within Scenario A or possibly Scenario B (300 and 600 dwellings respectively) with modest interventions to address highway capacity issues at key junctions and network pinch points and sustainable travel improvements.

3.5.3 In all scenarios significant levels of queuing are forecast at the junction of A4175 Keynsham Road with Avon Mill Road which is exacerbated with each development increment.

3.5.4 At the junction of the MMC with the A4, the point at which development traffic is added to the network, it is possible that the level of queuing seen in Scenarios C and D could be preventing traffic

getting to the model, and therefore the network impacts could be worse than forecast by the Paramics model.

3.6 Highway Mitigation

3.6.1 Based on the results of the modelling it appears that a development of around 300 dwelling accessed from the A4 to the east of Pixash Lane could be broadly accommodated on the local highway network with minimal highway mitigation. This would be particularly true if a package of sustainable and public transport infrastructure measures were to be introduced to enable a modal shift away from private car use for both existing and development related trip. The level of such infrastructure is discussed in the next section of this note.

3.6.2 Beyond the Scenario A development level development traffic impacts would have an increasing impact on network operation. A combination of sustainable travel improvements and highway capacity improvements will be required to mitigate the impacts of the development levels assumed within scenario B. Certainly with development at the levels assumed in Scenarios C and D a comprehensive package of measures would need to be delivered in order to offset development traffic impacts. However, this could potentially also be achieved through the introduction of significant highway mitigation at key locations on the network such as the implementation of improvements to Hick Gate Roundabout as part of the Hicks Gate Interchange proposals, and improvements to the Broadmead Roundabout, in addition to a package of sustainable transport improvements.

4 Alternative Mitigation Strategies

4.1 Low Carbon Transport

4.1.1 It is possible to minimise development traffic generation and offset development traffic impacts through the introduction of a comprehensive suite of active travel and public transport infrastructure measures in the North Keynsham area.

4.1.2 It has been forecast that the North Keynsham development traffic generation would be reduced by between 15% and 20% in the peak hours, and that around 90% of the residual development traffic impact could be offset by converting some of the vehicle trips already on the network to trips by bus, walk or cycle.

4.1.3 A comprehensive suite of active travel and public transport infrastructure measures would be expected to more than fully offset the level of development traffic forecast to be generated under development scenario D.

4.1.4 However, for the smaller development scenarios it may not be possible to fund and deliver the level of infrastructure required to achieve such significant modal shifts, particularly within the potential timescale for delivery of the smaller development proposals.

4.1.5 The TDM has therefore been used to consider a more modest package of measures, predominantly relying upon schemes which are committed, in principle at least, such as those set out within the Joint Local Transport Plan and the WECA Local Walking and Cycling Infrastructure plan.

4.1.6 The TDM modal shift assessment does not take account of strategic public transport and active travel projects which are likely to have a significant beneficial impact upon the modal choices made by residents of any development in East and North Keynsham. These projects have been committed to by WECA and its constituent Local Authorities, with schemes at various stages of development. Most relevant to the safeguarded land are:

- Bristol – Bath Mass Transit service, including the provision of parallel active travel infrastructure broadly following the A4 corridor;
- MetroWest improvements to rail services at Keynsham Station and the provision of a quality active travel route between Bath Hill and the railway station;
- Hicks Gate Interchange

4.1.7 These infrastructure measures will need to be in place to achieve a sufficient level of modal shift within the NK SDL, and it is therefore likely that they would need to be in place prior to the delivery of the development quantum's assumed in scenarios C and D.

4.2 Sustainable Travel Strategy

4.2.1 The Sustainable Travel Strategy considered within the TDM for the safeguarded land consists of:

- Upgraded bus stop facilities on A4 to metrobus standards, include the introduction of shelters, real-time information, cycle and scooter parking (subject to existing trial being extended to Keynsham or national legislation being introduced) and the introduction of high quality, direct, active travel routes through the development to access them.
- Enhanced local town centre bus service connecting the development site with the town more widely and providing an opportunity to interchange with mass transit services in the future. It has been assumed that these services would be able to access development sites in this area and consideration should be given to the introduction of modal filters to allow services to access the development from the west via the Chandag Estate to enable more efficient servicing of East Keynsham
- LCWIP route improvements to LTN 1//20 standard within Keynsham, specifically between the development location, Wellsway School, and Keynsham Town Centre;
- New active travel connection between the A4 and the Bristol Bath Railway Path via Clay Lane Bridge and associated crossing provision.
- New active travel connection between Bath Hill and Keynsham Railway Station;
- Liveable neighbourhood interventions within the Chandag Estates to produce conditions suitable for mixed traffic cycling on key streets (<2,000 vehicles AADT, 20mph).

4.2.2 Broadly this package of measures would provide a range of sustainable travel options for development in East Keynsham and would provide benefits to people travelling to, from and within the town already. A plan showing the active travel connections discussed above is provided within Appendix A.

4.2.3 This package of measures is forecast to result in around a 10% reduction in vehicle trip generation associated with the development site. Within Keynsham the measure will see cycling levels increase by between 25% and 75%, and public transport use increase by around 30%. More widely it is expected that the improved connections to the Bristol Bath railway path would result in an increase in cycle trips between Keynsham and both Bristol and Bath of around 15% compared to the baseline.

4.2.4 Combined the measures are likely to reduce vehicle trips within the study area by around 219 during the morning peak hour and by around 180 in the afternoon peak hour.

4.2.5 This would broadly offset the potential vehicle generation of the scenario A development proposals and would reduce the impact of the Scenario B development to the level of the unmitigated Scenario A development.

4.2.6 However, while the impact of the strategy would broadly offset the increase in trips across the whole network, this would not be true on a corridor by corridor basis. The strategy would focus modal shift within Keynsham, resulting in residual traffic increases along the northern, western and eastern corridors primarily. The change in flows on each corridor for the two peak periods can be seen below.

AM Peak	Scenario A		Scenario B	
	Arrival	*Departure*	*Arrival*	*Departure*
Central	-65	-48	-37	-1
West	7	23	31	62
East	6	30	25	60
North	2	24	22	63
South East	0	1	2	3
South West	-2	2	1	9

PM Peak	Scenario A		Scenario B	
	Arrival	*Departure*	*Arrival*	*Departure*
Central	-37	-51	9	-19
West	40	7	86	39
East	22	7	46	27
North	23	9	59	40
South East	1	0	3	2
South West	1	0	7	6

4.2.7 Within the modelled network this would primarily impact upon the operation of Avon Mill Lane and the Hicks Gate Roundabout, where the initial Paramics modelling runs identify some of the greatest unmitigated development traffic impacts, however the flows are all lower than had been assessed.

4.2.8 As discussed previously the impact of strategic transport initiatives such as Metrowest and mass transit have not been factored into this assessment. It is likely that these measures would mitigate some of the impact on the eastern and western corridors in particular.

5 Summary and Conclusion

5.1.1 This confidential technical note has been prepared by PJA with support from WSP in order to assist Bath and North East Somerset Council in considering whether additional land at East Keynsham should be allocated for development within the Local Plan Partial Update.

5.1.2 This note provides a high-level assessment of the potential traffic generation characteristics of development in this area and considers the impacts of development traffic upon the operation of the local highway network. The note also identifies the potential mitigation measures which may be required to ameliorate impacts in order for such development to be considered acceptable in the context of local and national planning policies.

5.1.3 This note considers four potential development scenarios for land to the east of Keynsham:

- Scenario A – 300 dwellings (safeguarded land only)
- Scenario B – 600 dwellings + 25% of Employment
- Scenario C – 900 dwellings + 50% of Employment + 1 FE school
- Scenario D – 1200 dwellings + 75% of Employment + 2FE school

5.1.4 Spatially it is considered unlikely that there is sufficient space to accommodate the level of development assumed within Scenarios C and D without incorporating land to the north of the railway which forms part of the potential North Keynsham SDL.

5.1.5 The unmitigated impact of the development traffic associated with each development scenario was assessed utilising the validated Paramics model of Keynsham. The modelling revelled that scenario A development would have a small impact upon network operation, with each increase in development increasing the level of impact. Subject to some targeted highway improvements it is considered that the level of development within scenario A could be accommodated on the local highway network without resulting in a severe impact. There may be an opportunity to bring forward a greater level of development up to around the level assumed in Scenario B, however this would require an additional study considering highway mitigation measures and junction operation in greater detail. However, it is considered that the impact of development scenarios C and D would certainly require significant capacity enhancements at key junctions along the A4 and with Keynsham in order to address significant reductions in the highway networks performance.

5.1.6 An alternative mitigation strategy for development in East Keynsham was also considered. This alternative mitigation strategy considered a modest set of active travel and public transport enhancements. The measures largely consisted of schemes which are committed or form part of adopted local transport plans.

5.1.7 The alternative mitigation strategy is considered likely to offset the volume of traffic generated by Scenario A development at East Keynsham overall. However, the benefits will be predominantly seen in the town centre with some residual traffic impacts along the western, eastern and northern corridors.

5.1.8 The level of residual impact for scenario A is small, typically less than one vehicle every minute (two-way) on any of these corridors. This is likely to be well within the daily fluctuation in flows on these corridors and the residual impact is likely to be negligible.

5.1.9 For Scenario B the level of residual impact is greater, with mitigated increases of up to two vehicles every minute on each corridor. While this is not likely to be perceptible within the daily fluctuations in flow along each corridor, the combined level of residual traffic could result in a noticeable increase in traffic on the A4 adjacent to the development site prior to being dispersed to the various travel corridors. The impacts would be broadly aligned with the unmitigated impacts of the scenario A development,.

5.2 Conclusion

5.2.1 Based on this high-level assessment it is considered that a development of around 300 dwellings could be accommodated on land to the east of Keynsham, and that with appropriate mitigation the highway impacts would be minimised and not result in a severe impact upon the operation of the local highway network or upon highway safety. The mitigation could take the form of highway capacity improvements, although mitigation through the introduction of active travel and public transport improvements would better align with current council policies related to the climate emergency response.

5.2.2 For development of between 300 and 600 dwellings mitigation comprising both highway capacity improvements and the introduction of active travel and public transport improvements would be required.

5.2.3 Active travel improvements and public transport services and infrastructure should be in place prior to occupation of any development in this area in order to embed sustainable travel behaviours and to give time for the improvements to impact upon background traffic flows.

5.2.4 It is recommended that a detailed transport assessment should be required as part of any application for planning consent, and this should consider the operation of key junctions, specifically the site access junction, Broadmead Roundabout, Hicks Gate Roundabout and the junctions at either end of Avon Mill Lane, and these assessments should take account of the modal shift for both development traffic and background traffic which could be achieved through the introduction of the package of sustainable transport measures outlined within this note.

5.2.5 It is not recommended that a larger development quantum (600+) dwellings be considered in this location without a more comprehensive network of active travel and public transport provision both within Keynsham and between Keynsham and surrounding settlements.

5.2.6 However, once the impact of the Covid-19 pandemic upon travel patterns and traffic growth is better understood it may be beneficial to revisit this assessment.

Appendix A Suggested Active Travel Network

A1

100 200 300 400 500 600 700

N

W E S

Existing cycle and pedestrian infrastructure along the Avon Ring Road

Memorial Road

Mixed traffic connection between Somerdale Bridge and Avon Ring Road facilities

A4174 Avon Ring Road

New pedestrian/cycle bridge over the River Avon delivered as part of the Somerdale Development

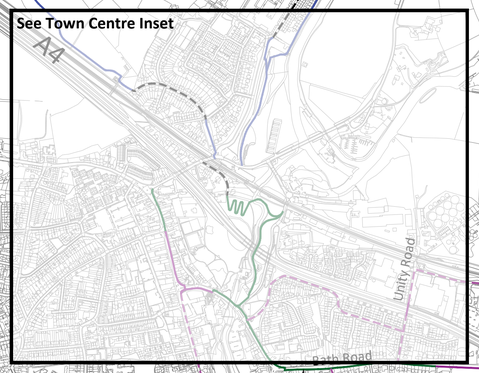
Indicative alignment of pedestrian / cycle route across Somerdale Development consisting of a mix of traffic free and low traffic streets

A4

A4175 Keynsham Road

A431

See Town Centre Inset



A4175 Durley Hill

Existing shared use facility along A4 upgraded to LTN 1/20 compliant segregated facility

Improve crossing facilities and provide walking & cycling connection to supermarket

Consider early delivery of active travel connection between Avon Valley Wildlife Park and the Bristol Bath Railway Pat

Pixash Lane

Bristol Bath railway path

New traffic free active travel route connecting the proposed multi-modal corridor with the Bristol Bath Railway Path

New traffic free active travel route connecting World's End Lane with the Bristol Bath Railway Path could be delivered as part of an initial phase of development between the A4 and the railway

A4

A431

Charlton Road

Wellsway

WECA LCWIP Route 2: Improvements to enable mixed traffic cycling with some segregation

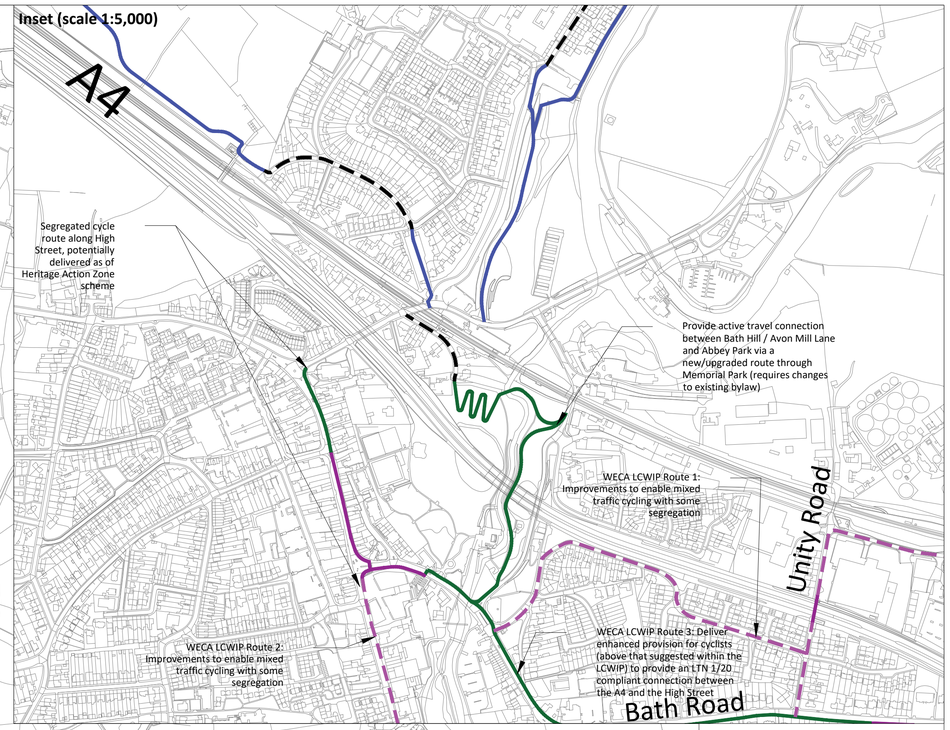
WECA LCWIP Route 3: Deliver enhanced provision for cyclists (above that suggested within the LCWIP) to provide an LTN 1/20 compliant connection between the A4 and the High Street

Potential traffic free connection through the Community Woodland to Manor Road

Existing shared use facility along A4 upgraded to LTN 1/20 compliant segregated facility

Some Liveable Neighbourhood interventions introduced on key streets within eastern Keynsham to reduce traffic volumes and speed to allow facilitate mixed traffic cycle routes (i.e 20mph + >2,000 vehicle per day)

Inset (scale 1:5,000)



NOTES

These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9

- Proposed traffic free or segregated pedestrian and cycle route
- On-street cycle link requiring improvement / intervention to make conditions suitable for mixed traffic cycling (>2,000 veh AADT & 20mph)
- Existing / Committed traffic free route retained for use by pedestrians and cyclists
- Existing shared use path proposed to be upgraded to provide a segregated pedestrian and cycle route
- Existing Low traffic / low speed street potentially suitable for mixed traffic cycling (>2,000 veh AADT & 20mph)

REV	DATE	REVISION NOTE	BY

PJA

Brew House - Jacob Street
Tower Hill - Bristol
BS2 0EQ - Tel: 0117 929 8856

Birmingham - Bristol
Exeter - London - Reading
pja.co.uk

CLIENT

B&NES Council

PROJECT

East Keynsham
Confidential Technical Note

DRAWING TITLE

Suggested Active Travel Network

DRAWING ISSUE STATUS

INFORMATION

PJA JOB No. SUB-CODE

04669 - SK - 009 - P0

Revision Letter : P - Prelim / A - Approval / T - Tender / C - Construction

BIM DRAWING REFERENCE

SCALE	DRAWN	REVIEWED	DATE
A1@1:10,000	AS	MM	07.06.21